

DaimlerChrysler AG

Patent claims

5 1. A method of reinforcing a hollow section having a closed periphery, an opening being produced at its periphery, after which a reinforcing component introduced into the hollow section interior is joined to the hollow section wall opposite the opening, characterized in that,
10 at the location of the opening (2) to be produced, a wall piece (7, 23), forming the reinforcing component, of the hollow section (1, 24) is cut out except for a peripheral region, in that the wall piece (7, 32) hanging in one piece on the opening edge (9) is bent into the hollow
15 section (1, 24), with the opening (2) being formed, the length of the wall piece (7, 23) being dimensioned relative to the width of the hollow section (1, 24) in such way that the wall piece (7, 23), with its free end (10, 26), at least comes into contact with the opposite
20 hollow section wall (11, 27), and in that the free end (10, 26) is then joined to the hollow section wall (11, 27).

2. The method as claimed in claim 1, characterized in
25 that the wall piece (7) has oversize with regard to its length relative to the width of the hollow section (1), in that the projecting wall strip (12) is bent over inside the hollow section (1) by means of a punch (3) plunging into the opening (2) and is brought to bear
30 against the hollow section wall (11) in such a way as to conform to the contour, and in that the wall strip (12) is joined to said hollow section wall (11).

3. The method as claimed in claim 2, characterized in

that the joining operation is effected by means of press joining.

4. The method as claimed in one of claims 1 to 3,
5 characterized in that the joining operation is effected by means of a welding method.

5. The method as claimed in claim 3, characterized in that the hollow section (1) is formed by internal high
10 pressure, and in that, following the forming in the internal high pressure tool, the opening (2) is formed at existing internal high pressure, the wall piece (7) is bent into the hollow section (1), and the wall strip (12) is bent over and press-joined to the opposite hollow
15 section wall (11).

6. A device for reinforcing a hollow section having a closed periphery, comprising a tool for forming an opening at the periphery of the hollow section, a means
20 for inserting a reinforcing component into the interior of the hollow section, and a joining device for connecting the reinforcing component to the hollow section wall opposite the opening, characterized in that the tool for forming the opening (2) is a perforating
25 punch (3, 22), on the end face (4) of which a cutting edge (5) is formed around part of the periphery, the rest of the periphery of the end face (4) of the punch (3, 22) having a bending contour (6), by means of which a wall piece (7, 23) cut out by the cutting edge (5) except for
30 a peripheral region and forming the reinforcing component can be bent into the hollow section interior (8, 25), during the plunging of said punch (3, 22), until the free end (10, 26) of the wall piece (7, 23) bears against the hollow section wall (11, 27), and in that a joining

device is provided, by means of which the free end (10, 26) can be joined to the hollow section wall (11, 27).

7. The device as claimed in claim 6, characterized in that, after the free end (10) of the wall piece (7) comes into contact with the hollow section wall (11), a wall strip (12), containing the free end (10), of the wall piece (7) can be bent over by means of the perforating punch (3) and brought to bear against the hollow section wall (11) in such a way as to conform to the contour, this wall strip (12) being formed by an oversize of the wall piece (7) with regard to its length relative to the width of the hollow section (1), and in that the perforating punch (3), at the end face (4), has a cutout (13) which starts from the bending contour (6) and in which the wall strip (12) is accommodated when being bent over and when being brought to bear.

8. The device as claimed in either of claims 6 and 7, characterized in that the joining device is a welding device.

9. The device as claimed in claim 7, characterized in that the joining device is a press-joining device, by means of which the wall strip (12) bearing against the hollow section wall (11) can be fastened to the latter.

10. The device as claimed in claim 9, characterized in that the press-joining device contains a joining punch (16) which is movably guided in a passage (15) of the perforating punch (3), said passage (15) opening out at the cutout (13) at the end face, and in that the press-joining device contains a die (18) which is formed with a recess (19) and bears against the outside (17) of the

hollow section (1), the recess (19) having undercut contours and being in alignment with the passage (15) of the joining punch (16).

5 11. The device as claimed in one of claims 6 to 10, characterized in that the perforating punch (3, 22) is integrated in an internal high pressure forming tool, in the impression of which the hollow section (1, 24) is accommodated.

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12. The device as claimed in claim 11, characterized in that the press-joining device is integrated in the internal high pressure forming tool.